IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): A process for producing a high-fluidity 1-butene-based polymer satisfying the following requirements (1), (2), and (3):

(1) has an intrinsic viscosity [η] of 0.01 to 0.5 dL/g as measured in a tetralin solvent at 135°C;

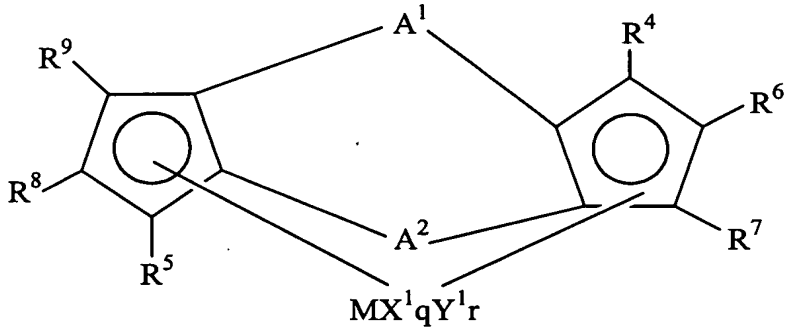
(2) is a crystalline resin having a melting point (Tm -D) of 0 to 100°C, the melting point being defined as a top of a peak observed on a highest-temperature side in a melting endothermic curve obtained by a differential scanning calorimeter (DSC) when a sample is held in a nitrogen atmosphere at -10°C for 5 min. and then heated at a temperature rise rate of 10°C/min.; and

(3) has a stereoregularity index {(mmmm)/(mmrr + rmmr)} of 30 or lower,

comprising:

homopolymerizing 1-butene, or copolymerizing 1-butene with ethylene and/or a C_3 to C_{20} α-olefin except for 1-butene, in the presence of a polymerization catalyst comprising:

(A) a transition metal compound having as a ligand, a double crosslinking type biscyclopentadienyl derivative represented by the following general formula (II):



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wherein M is a metal element belonging to Groups 3 to 10 or lanthanoid of the Periodic Table;

X^1 is a ligand ~~capable of forming~~ that forms a σ-bond with the proviso that when a plurality of X^1 groups are present, these X^1 groups may be the same or different from each other and may be cross-linked with the other X^1 or Y^1;

Y^1 is a Lewis base with the proviso that when a plurality of Y^1 groups are present, these Y^1 groups may be the same or different and may be cross-linked with the other Y^1 group or X^1;

R^4 and R^5 are independently a hydrogen atom, a halogen atom, a C_1 to C_{20} hydrocarbon group, a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group or a hetero atom-containing group, and R^6 and R^7 as well as R^8 and R^9 are bonded to each other to form a ring;

A^1 and A^2 are divalent cross-linking groups ~~capable of bonding the two ligands to each other~~ which may be the same or different from each other, and are independently a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group, a germanium-containing group, a tin-containing group, -O-, -CO-, -S-, $-SO_2-$, -Se-, $-NR^1-$, $-PR^1-$, $-P(O)R^1-$, $-BR^1-$ or $-AlR^1-$ wherein R^1 is a hydrogen atom, a halogen atom, or a C_1 to C_{20} halogen-containing hydrocarbon group;

q is an integer of 1 to 5 given by the formula:

[(valence of M) -2]; and

r is an integer of 0 to 3; and

(B) at least one component selected from the group consisting of (B-1) a compound capable of forming an ionic complex by reacting with said transition metal compound (A), and (B-2) aluminoxane.

Claim 2 (Currently Amended): A process for producing a high-fluidity 1-butene-based polymer satisfying the following requirements (1), (2), and (3'):

(1) has an intrinsic viscosity [η] of 0.25 to 0.5 dL/g as measured in a tetralin solvent at 135°C;

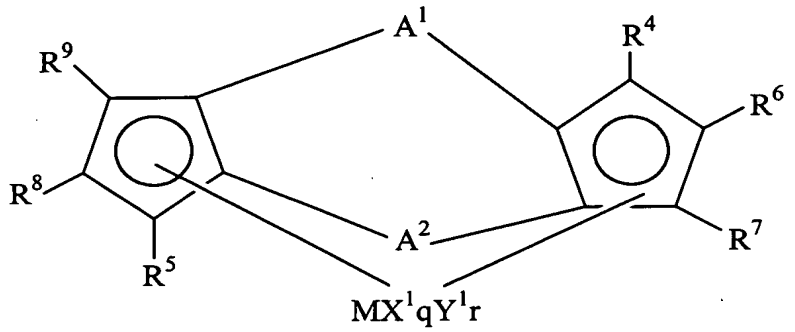
(2) is a crystalline resin having a melting point (Tm -D) of 0 to 100°C, the melting point being defined as a top of a peak observed on a highest-temperature side in a melting endothermic curve obtained by a differential scanning calorimeter (DSC) when a sample is held in a nitrogen atmosphere at -10°C for 5 min. and then heated at a temperature rise rate of 10°C/min.; and

(3') has a mesopentad fraction (mmmm) of 68 to 73% as determined from a nuclear magnetic resonance (NMR) spectrum,

comprising:

homopolymerizing 1-butene, or copolymerizing 1-butene with ethylene and/or a C_3 to C_{20} α-olefin except for 1-butene, in the presence of a polymerization catalyst comprising:

(A) a transition metal compound having as a ligand, a double crosslinking type biscyclopentadienyl derivative represented by the following general formula (II):



------- (II)

wherein M is a metal element belonging to Groups 3 to 10 or lanthanoid of the Periodic Table;

X^1 is a ligand ~~capable of forming~~ that forms a σ-bond with the proviso that when a plurality of X^1 groups are present, these X^1 groups may be the same or different from each other and may be cross-linked with the other X^1 or Y^1;

Y^1 is a Lewis base with the proviso that when a plurality of Y^1 groups are present, these Y^1 groups may be the same or different and may be cross-linked with the other Y^1 group or X^1;

R^4 and R^5 are independently a hydrogen atom, a halogen atom, a C_1 to C_{20} hydrocarbon group, a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group or a hetero atom-containing group, and R^6 and R^7 as well as R^8 and R^9 are bonded to each other to form a ring;

A^1 and A^2 are divalent cross-linking groups ~~capable of bonding the two ligands to each other~~ which may be the same or different from each other, and are independently a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group, a germanium-containing group, a tin-containing group, -O-, -CO-, -S-, $-SO_2-$, -Se-, $-NR^1-$, $-PR^1-$, $-P(O)R^1-$, $-BR^1-$ or $-AlR^1-$ wherein R^1 is a hydrogen atom, a halogen atom, or a C_1 to C_{20} halogen-containing hydrocarbon group;

q is an integer of 1 to 5 given by the formula:

[(valence of M) -2]; and

r is an integer of 0 to 3; and

(B) at least one component selected from the group consisting of (B-1) a compound capable of forming an ionic complex by reacting with said transition metal compound (A), and (B-2) aluminoxane.

Claim 3 (Previously Presented): The process according to claim 2, wherein said polymer has a zero-shear viscosity η^0 of 300 Pa·s or lower and a tensile elongation at break of 100% or more.

Claim 4 (Previously Presented): The process according to claim 1, wherein said polymer further satisfies the following requirements (4) and (5):

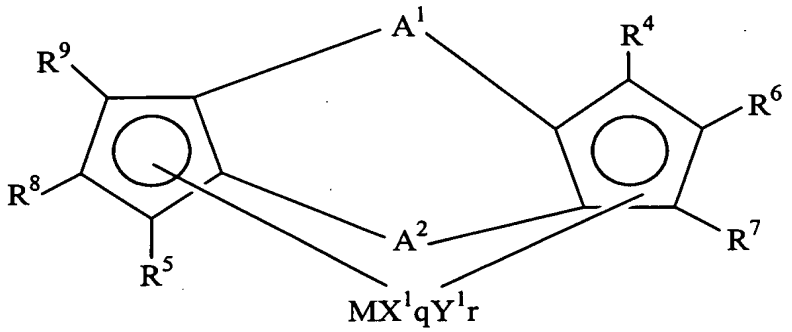
(4) a molecular weight distribution (Mw/Mn) of 4 or lower as measured by gel permeation chromatography (GPC); and

(5) a weight-average molecular weight (Mw) of 10,000 to 100,000 as measured by GPC.

Claim 5 (Currently Amended): A process for producing a high-fluidity 1-butene-based polymer, comprising:

homopolymerizing 1-butene, or copolymerizing 1-butene with ethylene and/or a C_3 to C_{20} α-olefin except for 1-butene, in the presence of a polymerization catalyst comprising:

(A) a transition metal compound having as a ligand, a double crosslinking type biscyclopentadienyl derivative represented by the following general formula (II):



------- (II)

wherein M is a metal element belonging to Groups 3 to 10 or lanthanoid of the Period Table;

X^1 is a ligand ~~capable of forming~~ that forms a σ-bond with the proviso that when a plurality of X^1 groups are present, these X^1 groups may be the same or different from each other, and may be cross-linked with the other X^1 group or Y^1;

Y^1 is a Lewis base with the proviso that when a plurality of Y^1 groups are present, these Y^1 groups may be the same or different from each other, and may be cross-linked with the other Y^1 group or X^1;

R^4 and R^5 are independently a hydrogen atom, a halogen atom, a C_1 to C_{20} hydrocarbon group, a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group or a hetero atom-containing group, and R^6 and R^7 as well as R^8 and R^9 are bonded to each other to form a ring;

A^1 and A^2 are divalent cross-linking groups ~~capable of bonding the two ligands to each other~~ which may be the same or different from each other, and are independently a C_1 to C_{20} halogen-containing hydrocarbon group, a silicon-containing group, a germanium-containing group, a tin-containing group, -O-, -CO-, -S-, $-SO_2-$, -Se-, $-NR^1-$, $-PR^1-$, $-P(O)R^1-$, $-BR^1-$ or $-AlR^1-$ wherein R^1 is a hydrogen atom, a halogen atom, or a C_1 to C_{20} halogen-containing hydrocarbon group;

q is an integer of 1 to 5 given by the formula:

[(valence of M) - 2]; and

r is an integer of 0 to 3, and

(B) at least one component selected from the group consisting of (B-1) a compound capable of forming an ionic complex by reacting with said transition metal compound (A), and (B-2) aluminoxane.

Claim 6 (Original): The process according to claim 5, wherein 1-butene is homopolymerized in the presence of the polymerization catalyst containing an organoboron compound as the component (B).

Claim 7 (Original): The process according to claim 5, wherein 1-butene is copolymerized with ethylene and/or a C_3 to C_{20} α-olefin except for 1-butene in the presence of the polymerization catalyst containing an organoboron compound as the component (B).

Claim 8 (Canceled).

Claim 9 (Previously Presented): The process according to claim 5, wherein the component (B) is an organoboron compound.

Claims 10-12 (Canceled).

Claim 13 (Previously Presented): The process according to claim 2, wherein said polymer further satisfies the following requirements (4) and (5):

(4) a molecular weight distribution (Mw/Mn) of 4 or lower as measured by gel permeation chromatography (GPC); and

(5) a weight-average molecular weight (Mw) of 10,000 to 100,000 as measured by GPC.